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09/990,923	11/16/2001	Kenneth Meade Lakin		3478

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EXAMINER

SUMMONS, BARBARA

ART UNIT PAPER NUMBER

2817

DATE MAILED: 06/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/990,923

Applicant(s)

Lakin

Examiner

Barbara Summons

Group Art Unit

2817

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 (three) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 4/7/03
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-16 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☒ Claim(s) 6-9, 14, and 16 is/are allowed.
- ☒ Claim(s) 1-5, 10, 12, 13, and 15 is/are rejected.
- ☒ Claim(s) 11 is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 7
- ☐ Interview Summary, PTO-413
- ☐ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other _____

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DETAILED ACTION

Specification

1. The substitute specification received 4/7/03 has been approved because it contains no new matter, and it has been entered.

Withdrawn Claim Rejections - 35 USC §§ 102 and 103

2. All rejections based upon Watanabe U.S. 6,492,759 have been overcome by Applicant's amendment received 4/7/03.

Maintained Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 4, 12, and 13 are rejected under 35 U.S.C. § 102(b) as being anticipated by Weber U.S. 5,864,261 (of record) mostly for reasons of record.

Regarding the new subject matter added to the claims and by added section [0044] of the specification defining "contiguous intervening layers..." as used in the claims, Weber discloses:

- (1) the second bulk acoustic wave (BAW) resonator 120 as being disposed above the first BAW resonator 100; and

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(2) intervening layers 140 and 150 form laterally contiguous layers (i.e. left-to-right in the figure) and meet Applicant's definition from section [0044] of the sub. spec. because every layer of acoustical stack 140 touches, via its major surfaces, the vertically next adjacent layer of the acoustical stack being of a different material (i.e. alternating layers of aluminum and chromium)[see col. 5, lns. 25-29], and every layer of the acoustical stack 140 also touches, via its side surfaces, the laterally adjacent layer 150 of a different material (i.e. AlN, ZnO or polysilicon)[see col. 8, lns. 55-58]. The thickness or width of the layers 140 and 150 in the lateral direction, affects the amount of acoustic coupling between the first and second resonators.

5. Claims 4, 5, 10, 13 and 15 are rejected under 35 U.S.C. § 102(b) as being anticipated by Poirier et al. U.S. 3,568,108.

Regarding claims 4 and 5, the figure of Poirier et al. discloses a microwave filter comprising: a first piezoelectric BAW resonator formed by layers 48/49/51 being connected to a signal input port 44; a second piezoelectric BAW resonator formed by layers 55/56/57 being connected to a signal output port 45 and disposed below the first BAW resonator; and a plurality of contiguous intervening layers 51/53/54 of differing materials (i.e. with alternating high/low impedances)[see col. 3, lns. 50-56] between the first and second BAW resonators and affecting the amount of the acoustic coupling therebetween (col. 3, lns. 55-59), and wherein the resonators are acoustically either approximately critically coupled or over-coupled (i.e. form a band pass filter)[see col. 4, lns. 5-9].

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Regarding claim 10, the first resonator includes piezoelectric layer 49. Because Poirier et al. discloses that the filter may have more than two such cascade coupled resonators (see col. 4, lns. 9-12), second BAW resonator (not shown) is disposed between the first and third resonators, that is, below the first/input BAW resonator (48/49/51) and above the third/output BAW resonator (55/56/57), and wherein between the first and second resonators and between the second and third resonators a plurality of the contiguous intervening layers (51/53/54) of differing materials are provided to affect the acoustic coupling between the associated resonators (col. 3, lns. 50-60 and col. 4, lns. 9-12).

Regarding claims 13 and 15, the figure of Poirier et al. also shows a substrate 43; and an acoustic reflector formed by layers 57/58/59/61 (see col. 3, ln. 65 to col. 4, ln. 1) which support the resonators and intervening layers.

Maintained and New Grounds of Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, 5, 10 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Weber U.S. 5,864,261 in view of Poirier et al. U.S. 3,568,108 (both of record) mostly for reasons of record.

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Regarding the claims newly added to this rejection (i.e. claims 3 and 5), Weber discloses that the filter of Fig. 5 be formed with only two resonators 100 and 120 with resonator 110 omitted (see col. 9, lns. 7-9). In this case one of the resonators must inherently be coupled to an input signal port and the other must inherently be coupled to an output port, wherein either resonator may be considered the "first" and the other the "second" resonator.

Poirier et al. shows the means of making the electrical connection at such input and output ports 44 and 45 of thin film resonators.

The reasons for the combination rendering the two resonator filter of claims 3 and 5 unpatentable, are the same as those stated regarding the three resonator filter of claims 10 and 15 in the prior Office action at paragraph 8.

Allowable Subject Matter

8. Claims 6-9, 14, and 16 are allowable over the prior art of record.
9. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
10. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 11 and 16, the reasons for indicating allowable subject matter remain as stated in paragraph 12 of the prior Office action.

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Regarding newly indicated allowable independent claim 6, the prior art of record does not show a microwave filter having each of the specifically recited features and also having some of the BAW resonators being "electrically connected" (see claim 6, lns. 6-7).

Response to Arguments

11. Applicant's arguments filed 4/7/03 have been fully considered but they are not persuasive.

Applicant's arguments regarding the Watanabe reference are persuasive, and those rejections based upon Watanabe have been withdrawn.

Regarding the Weber reference, Applicant argues that the layers 140 of Weber form an acoustical isolator which is "not used to provide a controlled amount of coupling between the resonators" (see page 8 of the amendment A received 4/7/03). This argument is not persuasive because: (1) the claims only require that the intervening layers are "affecting the amount of the acoustic coupling" (see e.g. claim 1, lns. 11-12), wherein "isolating" is a means of "affecting" the coupling; and (2) the Examiner has consistently used acoustical coupling plug 150 as one of the intervening layers, and plug 150 does control the coupling via its width in the left-to-right direction in Fig. 5.

Applicant argues that the plugs 150 and 151 are not composed of layers. This argument is not persuasive because the claims do not require such a structure. The claims do not point out any direction that the intervening layers must be arranged, and the Examiner has used the lateral direction combination of 140 and 150 along with the vertical individual layers of stack 140.

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Conclusion

12. Because claims 3 and 5 should have been included in the paragraph 8 rejection of the prior Office action, this Office action is not being made Final.

Additionally, the new 35 U.S.C. § 102(b) rejection based upon Poirier et al. should have been made in the prior Office action.

13. Any inquiry concerning this communication should be directed to Barbara Summons at telephone number (703) 308-4947, FAX no. (703) 308-7724, receptionist's no. (703) 308-0956, Supervisory Examiner Bob Pascal (703) 308-4909.



Barbara Summons
Primary Examiner
Art Unit 2817

bs
June 16, 2003